

Report

Comprehensive Wastewater Management Plan and Draft Environmental Impact Report Phase II –Alternatives and Site Identification

Nantucket, Massachusetts

Volume I of II

Prepared for:

Nantucket Department of Public Works
Nantucket, Massachusetts

Prepared by:

Earth Tech, Inc.
196 Baker Avenue
Concord, Massachusetts 01742-2167

September 2003

27355

**Comprehensive Wastewater Management Plan and
Draft Environmental Impact Report
Phase II –Alternatives and Site Identification
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September 30, 2003

Dear Project Reviewer:

Enclosed please find one copy of the report entitled "Comprehensive Wastewater Management Plan and Environmental Impact Report Phase II – Alternatives and Site Identification and Draft Environmental Impact Report" (Phase II Report) completed in accordance with the Massachusetts Department of Environmental Protection's "Guide to Wastewater Management Planning" dated January 1996. The review of the Comprehensive Wastewater Management Plan (CWMP)/Environmental Impact Report (EIR) will be through the submission of three documents including: (1) Phase I Report; (2) Phase II CWMP/Draft EIR; and (3) Phase III CWMP/Final EIR.

This Phase II Report is consistent with the general requirements of the MEPA regulations including being circulated per MEPA regulations at 301 CMR 11.16 (3). In addition, six (6) copies will be available for public review at the Selectmen and Town Clerk's Offices in the Town Hall, Department of Public Works, Nantucket Land Council, Nantucket Planning and Economic Development Commission and at the Antheneum (Public Library). The circulation list is included in Section 7 of the Phase II Report.

A 30-day public comment period on the Phase II Report will be initiated by a notice of availability for review in the Environmental Monitor. Comments received will be considered in determining the extent to which issues were adequately addressed. If you have comments, please send them to:

Secretary of Environmental Affairs
251 Causeway Street
Boston, MA 02114
Attention: MEPA Unit
MEPA #12617

If you have questions regarding this project, please do not hesitate to contact the MEPA office at 617-626-1000.

Very truly yours,
Earth Tech, Inc.

Thomas E. Parece, P.E.
Senior Project Director

Enclosures

**NANTUCKET, MASSACHUSETTS
CWMP/DEIR – PHASE II REPORT**

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EXECUTIVE SUMMARY

In 1998, the Nantucket Department of Public Works retained Earth Tech, Inc. to prepare an Island-wide Comprehensive Wastewater Management Plan/Environmental Impact Report (CWMP/EIR) to identify areas within the Island with sub-surface wastewater disposal problems and to develop a plan to mitigate or eliminate the problems. The Town established a special procedure for the review of this major and complicated project. This special procedure is a three-phase process during which the scope of future phases is based largely on the results of the preceding phase. The process consists of filing three documents: (1) Phase I, Needs Analysis; (2) Phase II, Alternatives and Site Identification and Draft Environment Impact Report; and (3) Phase III, Comprehensive Wastewater Management Plan and Final Environmental Impact Report. The results of the Need Analysis and preliminary screening of alternatives are included in this Document. This Document and further, more detailed analyses during the final Phase will provide the basis for the design and ultimate construction of the approved plan.

This Document contains the results of extensive efforts by Earth Tech, Inc. and the Town of Nantucket to evaluate the available options for improving the existing on-site wastewater disposal systems. In order to obtain as much information as possible on the existing and projected land use, demographic conditions and population, Earth Tech Inc., coordinated efforts with the Nantucket Planning and Economic Development Commission (NP&EDC) and the Massachusetts Estuary Project (MEP). The goals of the NP&EDC's , "The Nantucket Comprehensive Plan", coupled with the on-going Massachusetts Estuary Project (MEP) have been utilized in evaluations and analyses for the community presented in this Document and have been an integral force in the formation for the recommendations herein.

The MEP is currently gathering data in the Nantucket Harbor and Sesachacha Pond areas in order to provide technical data relative to the maximum amount of nitrogen (nitrogen threshold) that each estuary can tolerate without adversely changing its character and use. Madaket Harbor is also being studied but at a later target date than the above-mentioned areas. MEP will set the target to be achieved in order to protect and restore the health of the estuaries. Study areas affected by the MEP include Wauwinet, Quidnet, Pocomo, and Polpis. Until the MEP data is completed, these areas will be recommended to stay with their current on-site wastewater disposal systems but managed under the Septage Management Plan currently under planning stages rather than an attempt a temporary solution and have to change when the MEP data is in. Once the MEP data is complete, these areas will be further evaluated for long-term recommendations. A recommended solution will be made for Madaket in this Report, which is based on multiple criteria, in addition to the MEP.

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Other agencies utilized for information and considered herein are U.S. Soils Conservation Services, U.S. Department of Agriculture, U.S. Coast Guard, local planning officials, the Nantucket Historic Commission, the Natural Heritage Program, and local Town boards including Assessors, Building Department, Board of Health, Public Works Department, Zoning Officials, and Nantucket Planning and Economic Development Commission.

The Phase I, Needs Analysis was completed and filed with MEPA in August 2001. An Environmental Notification Form (ENF) was filed with MEPA in October of 2001 as well. The Phase I Document determined the areas on Island incapable of sustaining long-term with on-site wastewater disposal systems throughout and beyond the 20-year planning period. There were ten Study Areas identified as Needs Areas:

Madaket	Shimmo
Monomoy	Pocomo
Pocomo	Polpis
Polpis	Warrens Landing
Quidnet	Wauwinet

See the map at the end of this Executive Summary for a description and the challenge and solution for each of the ten identified Study Areas.

The scope of this Phase II CWMP/DEIR analyzed the selected alternatives in accordance with the revised scope that was issued by the Secretary of EOEA and comments received on the Phase I CWMP/EIR document. The MEPA Certificate, EOEA Number 12617, issued by the Secretary on November 16, 2001 asked for further clarification with regards to identification of Needs Areas and the methodology used in order to ensure the rankings and rationale for the Study Areas is clear and appropriate. The Secretary further clarified this “revised scope” in a letter dated May 17, 2002 where he states, “I hereby authorize you to submit a single filing that combines the Phase II document and the requested information updates and responses to comments received on the ENF and on the Phase I document”. The Response to Comments can be found in Appendix A and Earth Tech update on the information request from the MEPA Certificate issued November 16, 2001 can be found in its entirety in Section 1.

**NANTUCKET, MASSACHUSETTS
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This Phase II CWMP/DEIR document contains the preliminary investigation into the viability of siting wastewater treatment facility(s) and/or highly treated wastewater effluent disposal facilities in Nantucket. Site selection, for both the wastewater treatment facilities (WWTFs), and the effluent disposal field(s) is the most difficult to resolve. The screening criteria presented in this section were developed to assess the viability of 14 sites identified within Nantucket as potential wastewater treatment facility and/or wastewater disposal facility sites. The screening criteria used to evaluate these potential project sites was based upon eleven environmental criteria. The environmental screening criteria were chosen based upon review by the Project Proponent and upon comments received by the Proponent in the Secretary of the Executive Office of Environmental Affairs Certificate on the ENF dated October 2001. It was determined that by applying the screening criteria to the 14 identified sites a short list of selective potential sites would be established for additional evaluation through field testing. The screening criteria chosen to evaluate the potential project sites are: (1) wetlands; (2) soils; (3) drinking water supply - wellhead protection areas (Zone I and Zone II); (4) fisheries (including shellfish areas); (5) waterbodies (distance from surface water); (6) floodplains; (7) sensitive habitats; (8) park lands; (9) recreational resources; (10) agricultural/historical interests; (11) shoreline change data; and (12) in or adjacent to an Area of Critical Environmental Concern.

Wastewater treatment options were evaluated based on four levels of criteria. The first criteria, Technical Factors, included flow and loading, land/site requirements, suitability for groundwater discharge, climate, sludge disposal and ease of operation. The second criteria, Environmental Factors, included groundwater and permitting impacts. The third criteria, Institutional Factors, included community acceptance, regulatory and legal issues. The fourth criteria, Economic Factors, included construction cost and operations cost. Various wastewater treatment technologies were evaluated based on the above criteria and the Town of Nantucket's goals regarding the operation and maintenance of the facilities.

The Phase II CWMP/DEIR document presents recommendations for wastewater management in the above-mentioned ten identified areas of the Town of Nantucket where existing on-site wastewater disposal systems are shown to be inadequate for long-term wastewater disposal. Specific recommendations by Study Area have taken into account the appropriateness of utilizing: (1) innovative alternative systems; (2) communal systems; and (3) local wastewater collection, treatment, and disposal facilities. The Phase II CWMP/DEIR document evaluated the environmental impacts, technical design, institutional factors, and project costs associated with each alternative and recommends the appropriate solution to the wastewater disposal problems in the Town of Nantucket on a long term basis, with the exception of those areas included in the MEP Study Areas.

NANTUCKET, MASSACHUSETTS CWMP/DEIR – PHASE II REPORT

The Phase II CWMP/DEIR document recommends that the Town of Nantucket upgrade the existing Surfside Wastewater Treatment Facility, construct a new Madaket Wastewater Treatment Facility and provide sanitary sewer via low pressure sewers and/or gravity sewers to five needs areas (Madaket, Monomoy, Shimmo, Somerset and Warrens Landing), and to prepare a Septage Management Plan for the remainder of the Island. It is the most environmentally sound and cost-effective alternative and insures the sustainability of Nantucket's water resources for centuries to come. The recommended plan is estimated to be designed and constructed over a twelve-year period and has been divided into seven construction phases. The construction phases were developed based on: (1) the need of an area to be serviced; (2) funding constraints; and (3) minimizing construction related disruptions within the Town. The capital cost of the recommended plan is estimated at \$92.1 million and includes construction, engineering (design and construction), legal, fiscal, administrative, and contingency costs for providing sanitary sewerage to the five needs areas, and the construction of the Surfside WWTF upgrade and Madaket WWTF.

The Town of Nantucket is also in the process of evaluating and mapping its existing wastewater and stormwater infrastructure. This project has identified areas of the existing wastewater infrastructure that need to be rehabilitated in order to eliminate excessive infiltration and inflow from the system and areas of the existing stormwater infrastructure that needs be upgraded in order to eliminate street flooding and eliminate pollution from being discharge into Nantucket Harbor. It is recommended that the Town of Nantucket also implement the results of the Evaluation and Mapping Project. The capital cost of the recommended plan is \$83.3 million and includes construction, engineering (design and construction), legal, fiscal, administrative, and contingency costs for rehabilitation of existing wastewater and stormwater infrastructure.

The total O&M cost for the recommended plan identified in the Phase II CWMP/DEIR and Evaluation and Mapping Project is estimated at an average of \$2,730,000 per year. Costs are based upon present day, competitively bid construction work prices and on an Engineering News Record (ENR) Construction Cost Index of 6741 for September 2003.

The scope of the CWMP/FEIR Phase III document will present a final recommended plan and Final Environmental Impact Report based on the comments received during the public comment period for the CWMP/DEIR Phase II document. Appendix B contains the revised approved Scope of Work.

Challenge:
Evaluate alternatives for a 20-year solution to wastewater collection, treatment and disposal needs of the Town.

Solution:
An Island-wide study to maintain and/or improve environmental conditions while determining costs, benefits for long-term sustainability, protection of the sole source aquifer and public health, and preservation of Nantucket Harbor, Madaket Harbor, Polpis Harbor and Sesachacha Pond

Area of Wastewater Disposal Need Based on Wellhead Overlay Protection Zone

Town WPZ

Challenge

- Nantucket Harbor Watershed
- High Groundwater
- Private Water Supply & Wastewater Disposal
- Sewage Management Plan

Area of Wastewater Disposal Need Based on Harbor Watershed Line

Pocomo

Challenge

- Nantucket Harbor Watershed
- High Groundwater
- Private Water Supply & Wastewater Disposal
- Sewage Management Plan

Monomoy

Challenge

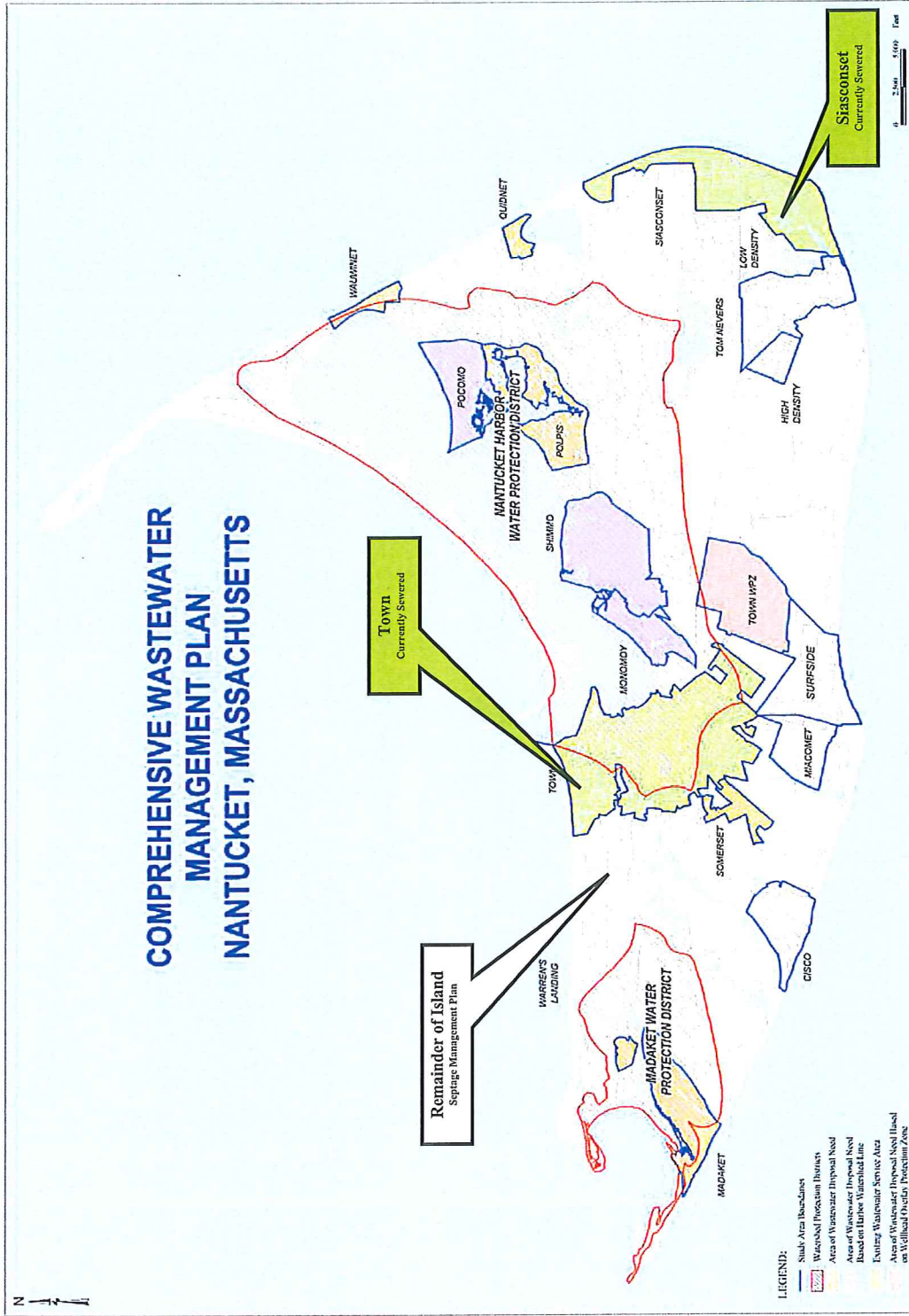
- Nantucket Harbor Watershed
- High Groundwater
- Private Water Supply & Wastewater Disposal
- Connect into Existing Wastewater System

Shimmo

Challenge

- Nantucket Harbor Watershed
- High Groundwater
- Private Water Supply & Wastewater Disposal
- Connect into Existing Wastewater System

Prepared For: Town of Nantucket, Department of Public Works, 188 Madaket Road, Nantucket, MA 02554
For Additional Information Contact: Mr. Jeffrey Willett, Director, Department of Public Works, 508-228-7244
Prepared By: Earth Tech, Inc., 196 Baker Avenue, Concord, MA 01742, Contact: Mr. Thomas Parece, P.E., 978-371-4142
Date Prepared: June 2003



Area of Wastewater Disposal Need

Madaket

Challenge

- Small Dense Lots
- Nantucket Harbor Watershed
- Madaket Harbor Watershed
- Private Water Supply & Wastewater Disposal
- Decentralize Wastewater Treatment

Polpis

Challenge

- Nantucket Harbor Watershed
- Degradation of Polpis Harbor
- High Groundwater
- Private Water Supply & Wastewater Disposal
- Sewage Management Plan

Quiddnet

Challenge

- Topography
- Small Dense Lots
- Private Water & Wastewater Disposal
- Sewage Management Plan

Somers

Challenge

- Small Dense Lots
- Private Water & Wastewater Disposal
- Connect into Existing Wastewater System

Warrons Landing

Challenge

- Madaket Harbor Watershed
- Small Dense Lots
- Private Wastewater Disposal
- Decentralize Wastewater Treatment

Wauwinet

Challenge

- Small Dense Lots
- Private Water Supply & Wastewater Disposal
- Sewage Management Plan